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# developers & builders

... soil surveys  
can help you



Soil Conservation Service  
U.S. Department of Agriculture



## DEVELOPERS AND BUILDERS

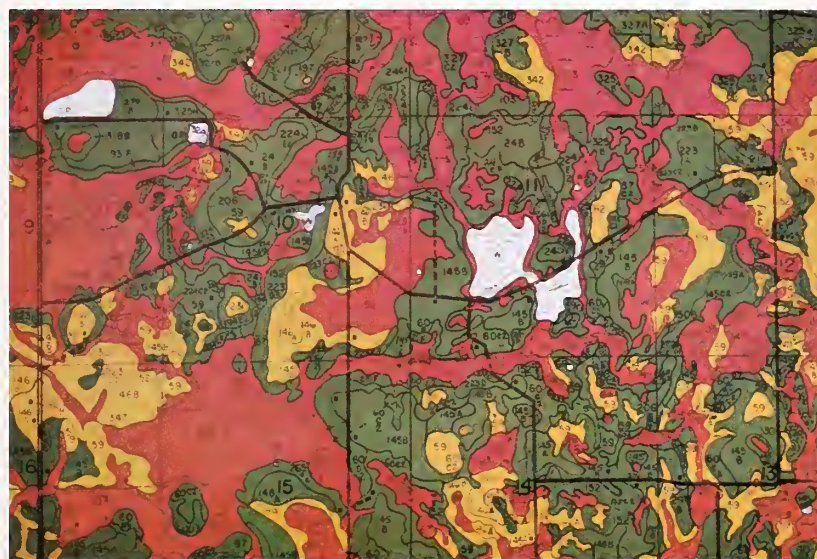
As developer or builder, you probably know of construction projects on which time and money were lost because of unforeseen soil hazards. This pamphlet tells how soil surveys available from the Soil Conservation Service (SCS) can help you anticipate soil hazards at proposed construction areas, plan optimum development, and insure adequate conservation during and after construction.

### Evaluating Land

Soil surveys available from SCS can help you determine whether tracts are suitable for development and avoid cost overruns caused by unforeseen soil hazards. By studying soil maps and supporting data in soil surveys, you can determine the soil conditions in areas where you plan to build and decide what additional investigations, if any, are needed.

Failure to anticipate adverse soil properties can be expensive. For example in suburban Maryland, 15 homes in a subdivision were not approved by building inspectors because the soils could not absorb septic effluent. The developer lost money on those homes mainly because he was unaware of the limitations of

Soil maps colored to show degree of soil hazards (red—severe, yellow—moderate, green—slight) can help in planning the layout of buildings and other structures.



Availability and price are not the only considerations in acquiring land for development. Floodprone areas such as this have severe hazards for housing and septic tank absorption fields.

Shrinking and swelling of the soil cracked the walls and foundation of this house. Soil surveys help you anticipate such soil hazards.



soils in the area for septic tank absorption fields.

Soil surveys can help you avoid the unnecessary complications that attend failure of foundations, soil slippage, flooded basements, and other structural breakdowns caused by

Good site development. The developer set aside this seasonally wet area for recreation use.



Seasonal wetness and other hazards that may delay construction or damage buildings are indicated in soil surveys.



Saving topsoil is a good conservation practice. Spreading the topsoil on the site after construction is completed helps in establishing vegetation.

adverse soil properties. Special foundations, walls, and floor drains can be planned if soil hazards indicate that buildings of standard design would likely fail. Soil surveys describe soil properties in detail so that you can anticipate such problems and prepare alternate designs or select other areas for development.

### **Area Development**

The manner in which tracts are subdivided is a major consideration in pricing units and estimating costs. Soil surveys can help you plan lot size and layout of buildings, streets, and utilities in accordance with soil suitability and limitations.

For example, a developer in Virginia planned to subdivide a 330-acre tract into 600 single family lots. County authorities pointed out that 120 acres had severe soil limitations for housing because slopes were steep, the soils were stony and shallow, and parts of the tract were subject to flooding.

The developer used a soil survey in preparing a new plan for the same total number of dwelling units. Detached homes and garden apartments were planned to replace some of the single family homes, and the flood plain and steep areas were reserved as open space for recreation use. The developer was given density credit for the land he assigned for public use. The final plan confined all construction to soils having favorable properties for homesites.

### **Site Conservation Plans**

Conservation plans are required by many communities before construction is authorized. Soil surveys provide the data needed to prepare an effective conservation plan based on the soil limitations and hazards in the developing area. Soil maps and data can help you plan measures to reduce erosion and sedimentation incident to development and adapt lots and streets to the natural terrain and soil conditions. They also can help you identify areas where measures to control runoff and insure adequate drainage are needed.

### **What Soil Data Are Available?**

SCS soil scientists study, evaluate, classify, and map soils in counties throughout the United States. Soil maps and descriptions of soils are published in soil surveys. The soil boundary lines shown on soil maps can be related to local plat maps to identify the kinds of soil in given areas.

Soil maps and supporting data provide information about important soil properties, including the following.

*Flood hazard.*—Soil surveys show areas that are subject to flooding. Although this information is not a substitute for hydrologic surveys to determine the limits of flooding on the basis of the severest flood expected once in 10, 25, 50, or 100 years, it does provide a good first approximation of the floodprone areas.

*Wetness.*—Soil surveys show whether the soil is well drained, poorly drained, or seasonally waterlogged, and whether the water table is seasonally high. They also rate the permeability of soils.

*Erodibility.*—Soil surveys give estimates of how susceptible the soil is to erosion. They also provide information about potential hazards of slippage, gullyng, sedimentation, and other site damage.

*Bearing capacity.*—Soil surveys provide test data and estimates of the physical properties of soils that enable engineers to make sound judgments about bearing capacities for shallow foundations. Major soil layers to a depth of about 5 feet are classified in both the Unified and the AASHO systems. Data also are given on grain-size distribution and expansiveness for each layer.

*Depth to rock.*—Soil surveys show where bedrock is at depths of less than 5 or 6 feet and describe the geologic material that underlies the soils.

*Shrink-swell and slippage.*—Soil properties that result in high swelling pressures, mainly the kind and amount of clay, are given in soil surveys. Soil surveys also indicate soil properties that make soils unstable and susceptible to slippage.

Soil scientists interpret the soil data and develop ratings of suitability and limitations of soils as sites for houses, small commercial buildings, shallow excavations, septic tank absorption fields, recreation areas, and many other uses.

Soil maps and supporting data can help developers and builders—

- Evaluate areas for construction of houses, schools, and commercial buildings.
- Determine the kind of soil material that must be excavated for basements and other underground structures.
- Estimate the capacity of soils to bear loads and anticipate required changes in design or compensating measures.
- Locate sources of sand and gravel, topsoil, and fill material.
- Determine adverse soil properties, such as flood hazard, high water table, seasonal wetness, and shrinking and swelling.
- Identify areas that require surface and subsurface water control.
- Determine the suitability of soils for septic tank absorption fields.

### **How to Obtain Soil Surveys**

Soil surveys of counties throughout the United States are made cooperatively by the Soil Conservation Service and state and other federal agencies. To determine whether a soil survey of the area that interests you is available, call the local office of the Soil Conservation Service. If the soil survey has not yet been published, you can arrange to examine completed soil maps and other data available in preliminary form.

Applicants for all Department programs will be given equal consideration without regard to race, color, sex, creed, or national origin.

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